The Frequency of Hapatitis C Virus (HCV) Infection in Mosul

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Abstract

The frequency of hepatitis C virus (HCV) infection in Mosul was assessed by mean of a recombinent-based immunoassay for serum anti-HCV antibody.

Serum samples from 14848 blood donors, 213 health-care workers, 543 actuely-ill patients suspected clinically of having viral hepatitis, 173 thalassemic patients, and 107 kidney patients were tested for the presence of anti-HCV by enzyme linked immunosorbent assay (ELISA).

Anti-HCV antibodies were detected in 0.64% blood donors, 0.47% health-care workers, 2.58% acutely ill-patients, but in 37.0% of the thalassemic patients and 40.2% of renal dialysis unit patients.

Introduction

Until relatively recently, it was believed that hepatitis B virus (HBV) and hepatitis A virus (HAV) were the only forms of viral hepatitis. But on virological and immunological basis distinct agents have been shown to exist, including the delta agent, or hepatitis D (HDV). This is a defective yirus requiring the hepatitis B virus to be present for its replication and expression[1].

On clinical and epidemiological basis, it has become clear that more than infections agent is responsible for non-A, non-B hepatitis (NANBH), so named becaus of the absence of serologic markers for hepatitis A or B in clinically diagnosed cases of heptitis. A virus associated with parentral transmission of NANBH has been classified as hepatitis C (HCV) and a form of hepatitis spread entreically and previously known as epidemic or water-born NANBH , is now known as hepatitis E (HEV)[2,3].

Most of the studies conducted until this time in Iraq have dealt with hepatitis B. This is justified on the light of the bad consequences such as liver liver cirrhosis and hepatoma this virus may have on some persons carrying it[4,5].

Infection with HAV, on the other hand, seems to be distributed thoughout the world mainly through

faecal-oral route, without prodducing a carrier state nor is it associated with those bad consequences as those found in HBV infection[6,7]. The incidence of HAV infection varies. In America anti-HAV was found in 44% ,a rate which increased with age and low age and socioeconomic standerd .in the mediterranean coutries the prevalence rate of anti-HAV was detected to be between 80-90%[9]. In Iraq(Baghdad) an anti-HAV of 97% was detected in the normal population [10].

As far as HBV infection is concerned Iraq is considered a country of medium endemicity rate[10,11,12]. Anti-HBs seroposivitity has been found to be up to 30.3% in the normal population[10] and HBsAg prevalence rate ranged between 3.6-5.9[10,12,13,14]. Similar and higher figures have been found to occur in other parts of the middle east regarding the prevalence of HBsAg; highest being found in Saudi Arabia (9.5%) and Turkey (9.2%)[15].

Studies, in some parts of the world have found that HCV infection traces HBV infection, more or less, in its mode of transmission and its future consequences, on the carrier persons[16,17,18,19]. Yet this infection has not been studied adequately in Iraq. This is because there has been no reliable method for testing the direct markers of this virus in persons suspected of being infected with it. But recently a recombinent immunoassay has been described which could detects anti-HCV antibody in persons infected with this virus[3.21]. Using this method it was thought appropriate to initiate a work that studies the extennt of HCV infection and to find out its most probable routes of transmission in Mosul, using different groups of persons.

Materials and Methods

1- Persons tested:

This study was conducted on five groups of persons, males and females as is shown in Table-1-, where two groups were of otherwise healthy persons including 14648 blood donors and 213 healthcar personnel (nurses and warddressers). The other three groups were of ill persons including 173 thalassemic children, 107 kidney patients, who attended renal dialysis unit for routine management, and 543 clinically acute-ill patients suspected by their physicians of having viral happatitis. The age rang and mean age and the share of each sex in each group was as seen in Table-1-.

2-Sera:

Five-ml blood sample was drawn from each person in seperate test tube containing no anticoagulant. Each sample was either centrifuged and the serum was tested for anti-HCV, by ELISA, on the day or kept at 4°C for over night to settle and then its serum was tested

for the presence of anti-HCV as described.

3- Test for anti-HCV:

For testing serum samples for the presence of anti-HCV the quantitative enzyme immuonoassay manfactured by United Biomedical Inc. USA abbreviated by (UBI HCV EIA) batch no. BJ00507, expiry date 5/97 was used:

This method is the same as the ones described by Choo *et. al.* and Kuo *et. al.*[3.21] and was done as follows: using 10 ml of serum samples and both negative and positive controls in each run. Each well in the microtitre plate containing 200ul of sample diluent so as to give a final dilution of 1:21 in each well. Each initially reactive specimen was retested in duplicate. Specimens which did not react in either of the duplicate repeat tests were considered non-reactive for antibodies to HCV. Initially reactive specimens which were reactive in one or both of the repeated test were considered repeatedly reactive for antibodies to HCV as assigned by the manufacturer.

Results

The results obtained in this study are summarised in Tables-1- and -2-.

Table-1- shows the details of the groups of persons included in this study with their sexes and the age range (and its mean) in years for each group. The Table also shows the number of positive sera for anti-HCV in each sex in each group and the percent positivity in each case. No. difference in the frequency of anti-HCV detected was noted in either sex in all groups.

Table-2- shows the results of test of sera, by ELISA, of different groups of persons for the presence of anti-HCV in Mosul. This Table shows that higher frequency of anti-HCV was detected in thalassemic patients and in kidney patients; two groups that are at "high risk" of getting infected with HCV. In other two groups; blood donors and health-care workers the frequencies were rather low. In group of acute patients the frequency was considered within expected reasonable levels.

Discussion

The frequency of HCV infection in blood donors as found in this study in Mosul, although it seems low (0.64%) yet on the light of the growing need of blood and blood products in general, this percentage can bulid-up into a substantial number, and on the other hand one can not neglect the importance of such route transmission. This is especialy true in patients who need multiple blood transfusion, e.g., thalassemic patients and patients attending renal dialysis unit. In these two groups of patients a very high incidence of

positive HCV infection rate was found in this study (37.0% and 40.2% respectively). These two groups of patients are actually considered at "high-risk" because they get the virus transmitted to them straght into their blood circulation when virus-contaminated blood is transfused to them as a result of their frequent need of it[16]. On the other hand, haemodialysis has been found to subject patients with renal failure to be carriers of HBV markers, due to immune deficiency, the cause of which is not fully understood[16]. This could be happening in HCV infection in these two groups of patients in this study predisposing them to become carriers with markers of HCV as well.

On the light of this finding in this study, it may be drawn that the most important cause of transmission of HCV, at least here in Mosul, is the multitransfusion of blood. Such route of transmission has also been found regarding infection of HCV in other countries[17.18.19]. This could explain why the incidence of HCV in health-care workers as found in this study is comparatively low (0.47%), because this virus does not seem to be transmitted by casual contact but rather by repeated transfer of infected blood.

In cases where acute hepatitis is suspected on clinical ground only, the percentage of HCV positive cases found in this study in Mosul (2.58%) lies whithin accepted levels taking in mind that in this group of patients infection with another hepatitis virus, namely hepatitis B (HBV) has been found to be much higher here in Mosul[12.22] and in Baghdad[10].

Contrary to infection with HBV[23.24], the frequency of detection of anti-HCV in either males and females was similar as found in this study (Table-1-) which could mean that the routeof infection rather than sex is the prime determinant factor in getting infected with HCV.

In conclusion it seems obligatory that any person should have a test for HCV before blood donation, the use of a sensitive and reliable test as the one used here will facilitate the job thus limit the spread of this type of hepatitis virus.

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Table (1)

group tested	Age range in years (mean age in years	No. tested	No. pf positives (% positivity)
Blood Donors	18 - 60	*M: 14238	91 (0.64)
	(30)	*F: 610	4 (0.66)
Health Workers	17 - 45	M: 96	Nil (0.00)
	(27)	F: 117	1 (0.85)
Thalassemic Patients	1 - 17	M: 94	35 (37.2)
	(7.6)	F: 79	29 (36.6)
Acute-ill Patients	16 - 48	M: 294	8(2.81)
	(31)	F: 249	6(2.41)
Kidney Patients	15 - 56	M: 59	24(40.6)
	(38)	F: 48	19(39.5)

* M= Males , F = Females

Table (2)

group tested	Number tested	No. of positives	Percent positivity(%)
Blood Donors	14848	95	0.64
Health Workers	213	1	0.47
Thalassemic Patient	173	64	37.0
Acute-ill Patients	543	14	2.58
Kidney Patients	107	43	40.2

الخلاصة

تم دراسة مدى انتشارية الاصابة بفايروس التهاب الكبد الفايروسي نمط -جـ- بطريقة المقايسة المناعية الانظيمية وذلك بالكشف عن الضد السطحي (Anti HCV) الخاص بالفايروس.

مصول دم من ١٤,٨٤٨ متبرع بالدم، ٢٣١ من العاملين بردهات المستشفيات ، ٥٤٣ من مرضى حالات حادة للكبد ، ١٧٣ من مرض فقر الدم البحري و ١٠٧ مرضى مزمنين بالكلية فحصت بطريقة المقايسة المناعية الانظيمية (الاليزا).

الضدات السطحية لفايروس التهاب الكبد الفايروسي نمط -جـ- كشفت بـ ٠,٦٤٪ من متبرعي الدم و ٠,٤٧٪ من العاملين بالصحة و ٢,٥٨٪ من مرضى الحالات الحادة للكبد ولكن في ٣٧,٠٪ من مرضشى فقر الدم البحري و ٤٠,٢٪ من مرضى الكلى المزمنين .